

10010828-1

10/617,547

REMARKS

This is a full and timely response to the non-final Official Action mailed February 9, 2007. Reconsideration of the application in light of the above amendments and the following remarks is respectfully requested.

Claim Status:

Claims 19-26 and 51-72 were withdrawn from consideration under a previous Restriction Requirement and cancelled without prejudice or disclaimer. By the present paper, various claims have been amended, and new claim 94 has been added. Thus, claims 1-18, 27-50 and 73-94 are currently pending for further action.

Prior Art:

Claims 1-13, 27-40, 43, 44, 46-50, 76, 81, 86 and 92 were rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,440,594 to Kindler et al. ("Kindler"). For at least the following reasons, this rejection is respectfully traversed.

Claim 1 recites:

A device comprising:
an electronically controllable drop ejection device *comprising a jetting device* in fluid communication with an electrochemical cell, the jetting device configured for outputting *a measured stream of liquid droplets* of a chemical composition capable of oxidative reaction into the electrochemical cell.

(Emphasis added).

Claim 27 recites:

An electrochemical system comprising:
an electrochemical cell capable of sustaining at least one oxidation reaction process; and
a fuel supply apparatus delivering a composition containing at least one compound capable of oxidative reaction into the electrochemical cell, the fuel supply

10010828-1

10/617,547

apparatus comprising at least one electronically controllable drop ejection device and at least one fluid storage chamber,

wherein said electronically controllable drop ejection device comprises a jetting device configured for outputting a measured stream of liquid droplets of said compound capable of oxidative reaction into the electrochemical cell.

(Emphasis added).

Support for the amendment to claims 1 and 27 can be found in Applicant's originally-filed specification at, for example, p. 7, lines 13-18 and p. 18, line 25 to p. 19, line 9.

As is well known in the relevant art, a "jetting device" emits a liquid stream or "jet" of liquid drops. An example of a jetting device is an inkjet device that emits a stream of ink droplets. (Applicant's specification, p. 15, lines 25-31). An inkjet device or other jetting device can precisely measure the quantity of liquid ejected. (Applicant's specification, p. 18, line 25 to p. 19, line 9).

In contrast to claims 1 and 27 and the recited jetting device, Kindler teaches an "Aerosol Feed Direct Methanol Fuel Cell." (Kindler, title) (emphasis added). Thus, rather than teaching or suggesting the claimed "jetting device," Kindler only teaches aerosol generators for generating an aerosol in a fuel cell. (Kindler, col. 2, lines 10-65).

An aerosol is defined as "a suspension of fine solid or liquid particles in gas." (Meriam-Webster's Online Dictionary, <http://www.m-w.com>). The liquid droplet stream of a "jetting device" is clearly not, and cannot be considered, an aerosol, i.e., a suspension of solid or liquid particles in a gas.

Moreover, an aerosol generator does not output a *measured* stream of liquid droplets as does the claimed jetting device.

Thus, Kindler does not teach or suggest the claimed "jetting device configured for outputting a measured stream of liquid droplets" to an electrochemical cell. "A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is

10010828-1

10/617,547

found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. For at least these reasons, the rejection based on Kindler of claims 1 and 27, and their respective dependent claims, should be reconsidered and withdrawn.

Independent claim 43 recites:

A power generator comprising:
an electrochemical cell having at least one reactive surface;
an electronically controllable jetting device supplying a fuel to the at least one reactive surface in the electrochemical cell; and
a recirculating circuit configured to convey a portion of at least one chemical byproduct produced in the electrochemical cell into reintegrative contact with the fuel.

(Emphasis added).

Independent claim 48 recites:

A device comprising: a storage chamber containing a fuel;
an electrochemical cell associated with the fuel storage chamber;
an electronically controllable jetting device for delivering discrete quantities of fuel from the storage chamber to the electrochemical cell;
a recirculation circuit transporting at least a portion of a byproduct material produced in the electrochemical cell into contact with the fuel delivered from the storage chamber; and
a power consuming device powered by the electrochemical cell.

(Emphasis added).

In regard to claims 43 and 48, the recent Office Action argues that Kindler teaches the claimed recirculating circuit at col. 10, lines 13-32. (Action of 2/9/07, p. 3). This is incorrect.

The cited portion of Kindler teaches as follows.

Carbon dioxide gas produced by the above reaction is withdrawn along with a portion of the fuel aerosol (suspension of methanol droplets in a gas comprising carbon dioxide) from anode chamber vent 23. The liquid methanol droplets may pass through

10010828-1

10/617,547

a duct 31 to a droplet recovery unit 19 where liquid methanol is separated from the gas. Liquid methanol may be returned to the methanol pump 20 through duct 29. (Kindler, col. 10, lines 13-32).

Thus, Kindler teaches that unused fuel (i.e., methanol) is separated from the byproducts produced in the reaction (e.g, carbon dioxide) and *then* returned to the methanol pump (20). The unused fuel is a substance that exists in the system prior to the reaction in the electrochemical cell and is not a byproduct *produced in the electrochemical cell*. Thus, Kindler does not teach or suggest the claimed recirculating circuit in which a portion of at least one chemical byproduct *produced in the electrochemical cell* is reintegrated into the fuel supply.

Consequently, Kindler does not teach or suggest the power generator of claim 43 comprising the claimed recirculating circuit or the device of claim 48 comprising the claimed recirculation circuit. "A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. For at least these reasons, the rejection based on Kindler of claims 43 and 48, and their respective dependent claims, should be reconsidered and withdrawn.

Additionally, various dependent claims of the application recite further subject matter that is clearly patentable over the cited prior art. Specific, non-exclusive examples follow.

Claim 3 recites:

a channel for removing a byproduct produced by the oxidative reaction from the electrochemical cell, the channel communicating with the electronically controllable drop ejection device, wherein the electronically controllable drop ejection device introduces the reaction byproduct into contact with the chemical composition capable

10010828-1

10/617,547

of oxidative reaction in a stoichiometric relationship appropriate for function of the electrochemical cell.

Claims 13, 33 and 38 recite similar subject matter. As demonstrated above with respect to claims 43 and 48, Kindler does not teach or suggest this subject matter of recirculating a byproduct produced in an electrochemical cell back into the fuel stream. For at least this additional reason, the rejection of claims 3, 13, 33 and 38, and their respective dependent claims, should be reconsidered and withdrawn.

Claim 4 depends from claim 3 and recites "wherein the drop ejection device is configured to affect proportionate delivery of the byproduct of oxidative reaction and the chemical composition capable of oxidative reaction into contact with the electrochemical cell." Kindler does not teach or suggest this subject matter. Moreover, the recent Office Action does not indicate how or where the cited prior art teaches or suggests this subject matter. For at least this additional reason, the rejection of claim 4 should be reconsidered and withdrawn.

Claim 6 recites "an admixer in fluid communication with the drop ejection device, the admixer tank configured to receive the chemical composition capable of oxidative reaction and at least one other additional material." Claims 37 and 47 recite similar subject matter. In contrast, Kindler fails to teach or suggest this subject matter. The recent Office Action refers in this regard to Kindler's teaching of removing unused fuel from the output of the electrochemical cell and adding that recovered fuel to the fuel supply. (Action of 2/9/07, p. 3). However, the adding of more fuel to a fuel supply has nothing to do with the claimed admixer in which a chemical composition (e.g., fuel) is mixed with "at least one *other additional material*." (Claim 6, emphasis added). Thus, Kindler clearly fails to teach or

10010828-1

10/617,547

suggest the subject matter of claims 6 and 37. For at least this additional reason, the rejection of claims 6, 37 and 47 should be reconsidered and withdrawn.

Claim 8 recites "wherein the nozzle member directs ejection of chemical composition capable of oxidative reaction into a *liquid* fluid stream, the fluid stream being conveyed onto the anode of the electrochemical cell." (Emphasis added). In contrast, as demonstrated above, Kindler teaches the delivery of an aerosol, not a liquid fluid stream, to an electrochemical cell. Consequently, Kindler clearly fails to teach or suggest the subject matter of claim 8. For at least this additional reason, the rejection of claim 8 should be reconsidered and withdrawn.

Claim 10 recites "a first electronically controllable drop ejection device is in fluid communication with a first composition capable of oxidative reaction and a second electronically controllable drop ejection device is in fluid communication with at least one second composition capable of admixture with the first chemical composition in a manner which facilitates the oxidative reaction." As demonstrated above, Kindler fails to teach or suggest this subject matter. For at least this additional reason, the rejection of claim 10 should be reconsidered and withdrawn.

Claim 31 recites "wherein the composition containing at least one chemical component capable of undergoing oxidative reaction is contained in a first fluid storage chamber and wherein a second fluid storage chamber contains at least one compound which is complementary to the oxidative process occurring in the electrochemical cell." Claim 50 recites similar subject matter. The recent Office Action fails to indicate how or where the cited prior art of Kindler teaches or suggests this subject matter. For at least this additional reason, the rejection of claims 31 and 50 should be reconsidered and withdrawn.

10010828-1

10/817,547

Claim 46 recite "a regulator, the regulator operable on the recirculating circuit to deliver measured quantities of recirculated byproduct into contact with the fuel in at a specified ratio range, the specified ratio range being one which will facilitate oxidative reaction processes proceeding in the electrochemical cell." The recent Office Action fails to indicate how or where the cited prior art of Kindler teaches or suggests this subject matter. For at least this additional reason, the rejection of claim 46 should be reconsidered and withdrawn.

Claims 14-18, 41, 42 and 45 were rejected as unpatentable under 35 U.S.C. § 103(a) over the combined teachings of Kindler and U.S. Patent No. 5,746,985 to Takahashi ("Takahashi") This rejection is respectfully traversed for at least the same reasons given above with respect to claims 1, 27 and 43 and for the following additional reasons.

Additionally, claim 14 recites "wherein the electronically controllable drop ejection device comprises a resistor surface having at least one catalytic material positioned thereon, the catalytic material reactive with a component in the chemical composition capable of oxidative reaction to effect at least partial catalytic reforming of the component of the chemical composition." Claims 16 and 41 recite similar subject matter. Applicant notes that the resistor surface with the catalytic material is recited in the claims as being in the drop ejection device. Emphasizing this point, claim 15 further recites "wherein catalytic reforming occurs prior to exit from the drop ejection device."

The Office Action acknowledges that Kindler fails to teach or suggest the subject matter of claim 14 and so cites to Takahashi. (Action of 2/9/07, p. 4). Takahashi teaches "a heating resistor disposed inside a *reforming reactor*." (Takahashi, col. 2, lines 63-64) (emphasis added). Takahashi further teaches that the heating resistor can be embedded in a

10010828-1

10/617,547

catalyst. (Takahashi, col. 3, lines 3-5). However, Takahashi does not teach or suggest such a reactor disposed in a drop ejection device as claimed. Consequently, the combination of Takahashi and Kindler fails to teach or suggest all the features of claims 14-17, 41 and 42.

Applicant further notes that the recent Office Action fails to address this point which was made by the Applicant previously. For at least these additional reasons, the rejection of claims 14-17, 41 and 42 should be reconsidered and withdrawn.

Claims 73-75, 78-80, 84, 85, 89, 90 were rejected as being unpatentable under 35 U.S.C. § 103(a) over the combined teachings of Kindler and U.S. Patent No. 6,372,483 to Schleifer et al. ("Schleifer"). This rejection is respectfully traversed for at least the same reasons given above with respect to the various independent claims and for the following additional reasons.

Claim 73 recites "wherein said drop ejection device comprises an inkjet drop ejection device." The recent Office Action concedes that Kindler fails to teach or suggest this subject matter. (Action of 2/9/07, p. 5). Consequently, the Action cites to Schleifer, which mentions an inkjet drop ejection device, and proposes to combine the teachings of Kindler and Schleifer in this regard. (*Id.*).

This proposed combination ignores the facts that Kindler calls for an aerosol generator, as demonstrated above, and an inkjet drop ejection device is *not* an aerosol generator. Consequently, it is entirely unclear how one of skill in the art would have been lead to combine the teachings of Kindler and Schleifer as proposed in the recent Office Action.

10010828-1

10/617,547

The same is true of claim 74 which recites "a thermal drop ejection device," and claim 75 which recites "a piezoelectric drop ejection device." Claims 78-80, 84, 85, 89 and 90 also recite parallel subject matter.

For at least these additional reasons, the rejection of claims 73-75, 78-80, 84, 85, 89, 90 should be reconsidered and withdrawn.

Lastly, the recent Office Action rejected claims 77, 82 and 88 as being unpatentable under 35 U.S.C. § 103(a) over the combined teachings of Kindler and U.S. Patent App. Pub. No. 2003/0194585 to Gore ("Gore"). This rejection is improper under 35 U.S.C. § 103(c).

35 U.S.C. § 103(c) states:

Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Applicant notes that Gore is available as prior art against the present application only under 35 U.S.C. § 102(e). The present application was filed July 10, 2003. The Gore reference was *subsequently* published on October 16, 2003. Consequently, Gore is available as prior art against the present application only under 35 U.S.C. § 102(e).

Applicant also notes that Gore is assigned to the Hewlett-Packard Co. (See, recorded assignment at reel/frame 013083/0375). Similarly, the present application is also assigned to Hewlett-Packard Co. (See, recorded assignment at reel/frame 015023/0934). Applicant hereby states that the subject matter of the present application and the Gore reference were, at the time the invention of the present application was made, owned by, or subject to an obligation of assignment to, the same person, i.e., Hewlett-Packard Co. (See MPEP § 706.02(1)(2)).

10010828-1

10/617,547

Consequently, under 35 U.S.C. § 103(c), the Gore reference cannot be applied as prior art against the present application under 35 U.S.C. § 103(a). Therefore, the rejection of claims 77, 82 and 88, which applies Gore under § 103(a), must be reconsidered and withdrawn.

Conclusion:

The newly added claim is thought to be patentable over the prior art of record for at least the same reasons given above with respect to the original independent claims.

Therefore, examination and allowance of the newly added claim is respectfully requested.

For the foregoing reasons, the present application is thought to be clearly in condition for allowance. Accordingly, favorable reconsideration of the application in light of these remarks is courteously solicited. If the Examiner has any comments or suggestions which could place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the number listed below.

Respectfully submitted,

DATE: May 8, 2007



Steven L. Nichols
Registration No. 40,326

Steven L. Nichols, Esq.
Managing Partner, Utah Office
Rader Fishman & Grauer PLLC
River Park Corporate Center One
10653 S. River Front Parkway, Suite 150
South Jordan, Utah 84095
(801) 572-8066
(801) 572-7666 (fax)

CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being transmitted to the Patent and Trademark Office facsimile number **571-273-8300** on **May 8, 2007**. Number of Pages: **27**



Rebecca R. Schow